10-4: Streamlining the Bay Agreement (evolving ideas)

PT

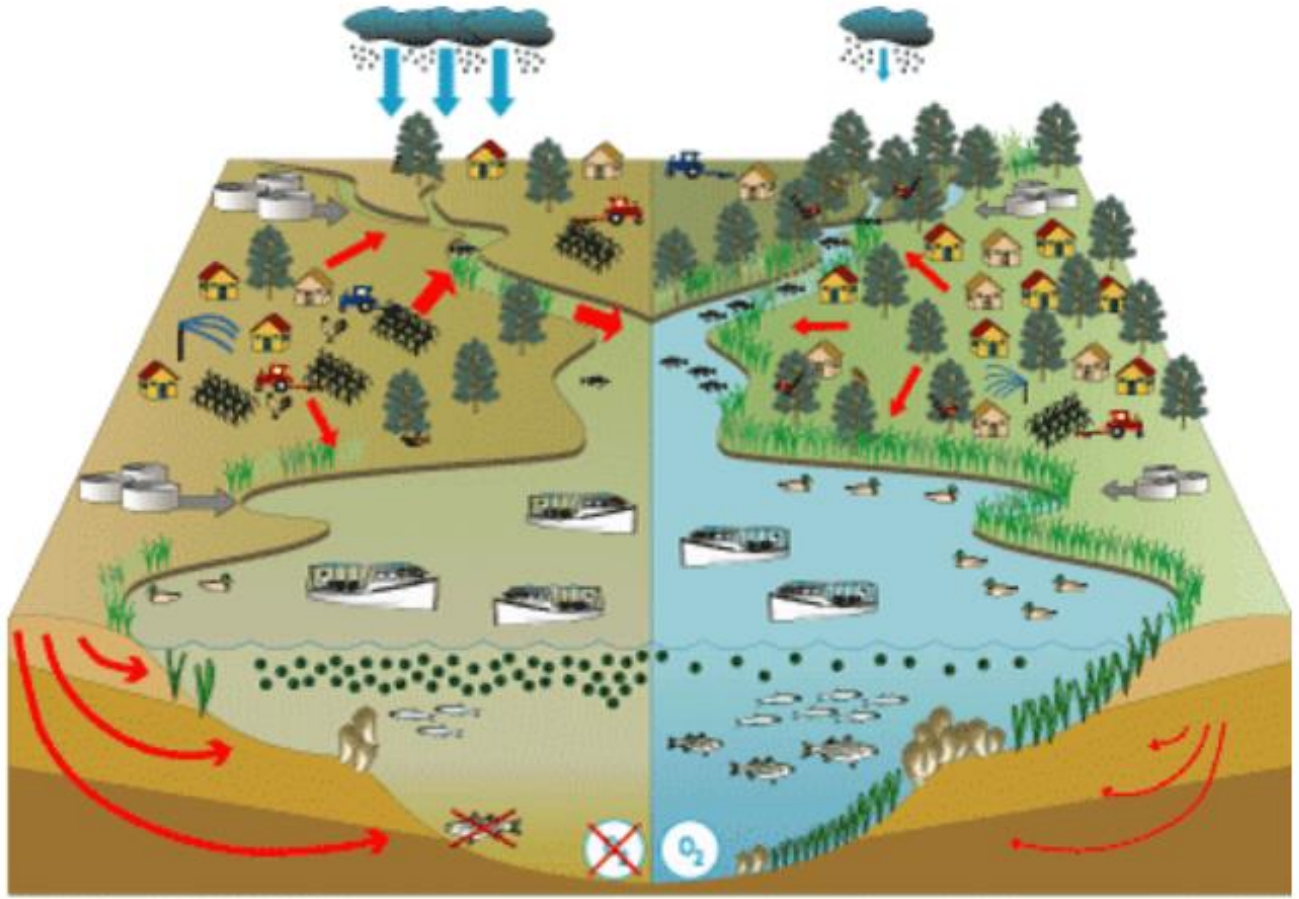
March 2025

Draft thinking

P. Tango

Restoring Chesapeake Bay and the Watershed

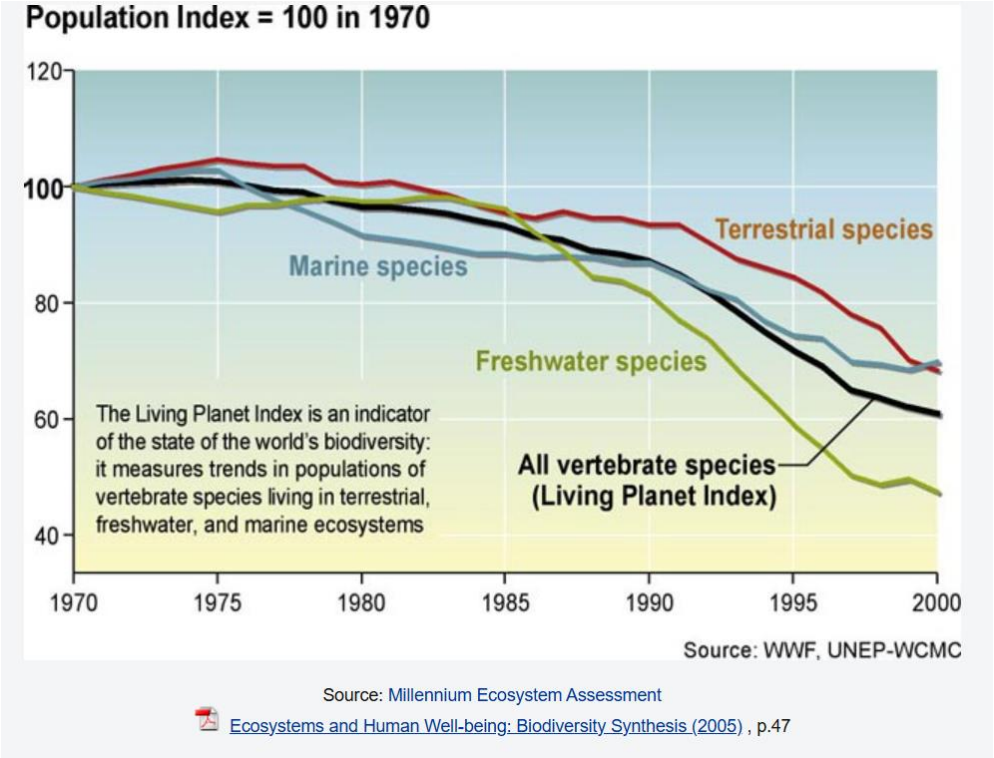
Reminder – Conceptual Model



Global perspective: Big picture challenges

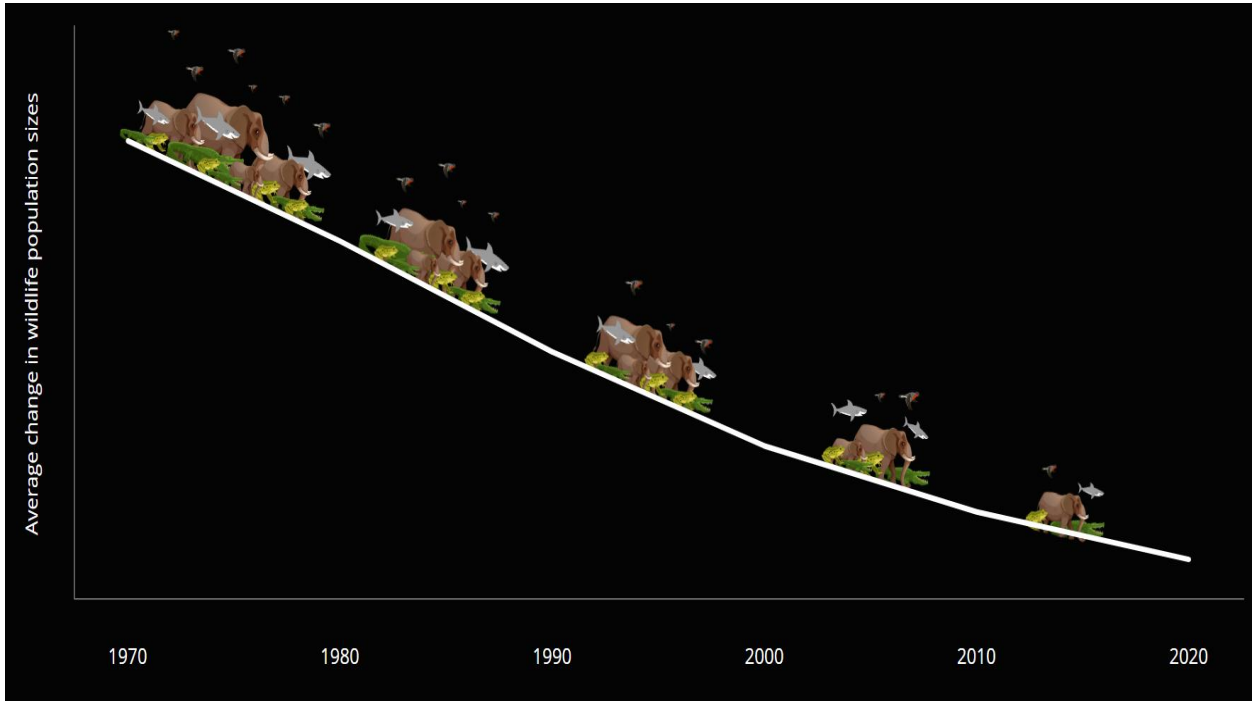
We are experiencing complementary system-wide degradation trajectories.

We need cross-cutting issue-focused solutions.



Source: Millennium Ecosystem Assessment
Ecosystems and Human Well-being: Biodiversity Synthesis (2005) , p.47

30-year summary trends
2000 Living Planet Index

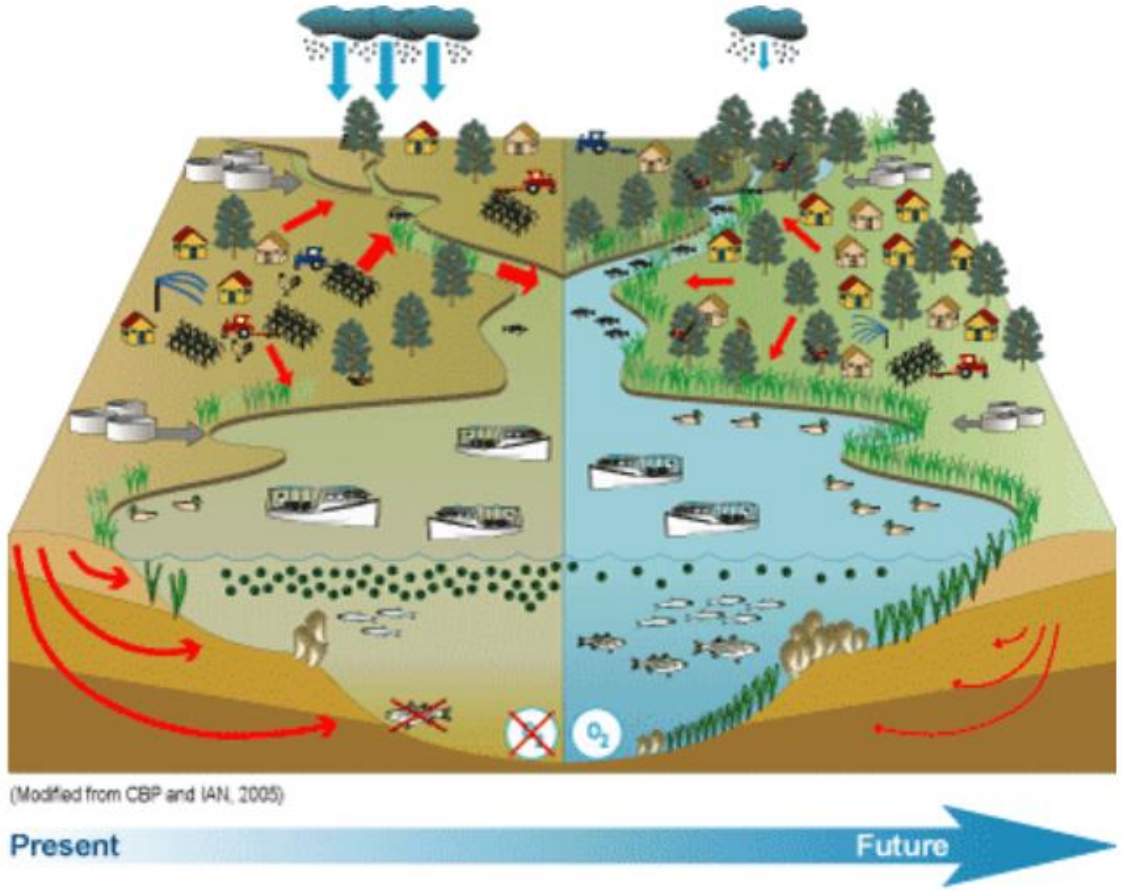


50-year summary trends
WWF 2024 Living Planet Index

Restoring Chesapeake Bay and the Watershed

Landscape
(**Physical** Environment)

Water
(**Chemical** Environment)



Living Resources
(**Biological** Environment)

Community
(**Social** Environment)

Context
(Rising temps, increased rains, sea level rise, novel ecology)

Restoring Chesapeake Bay and the Watershed

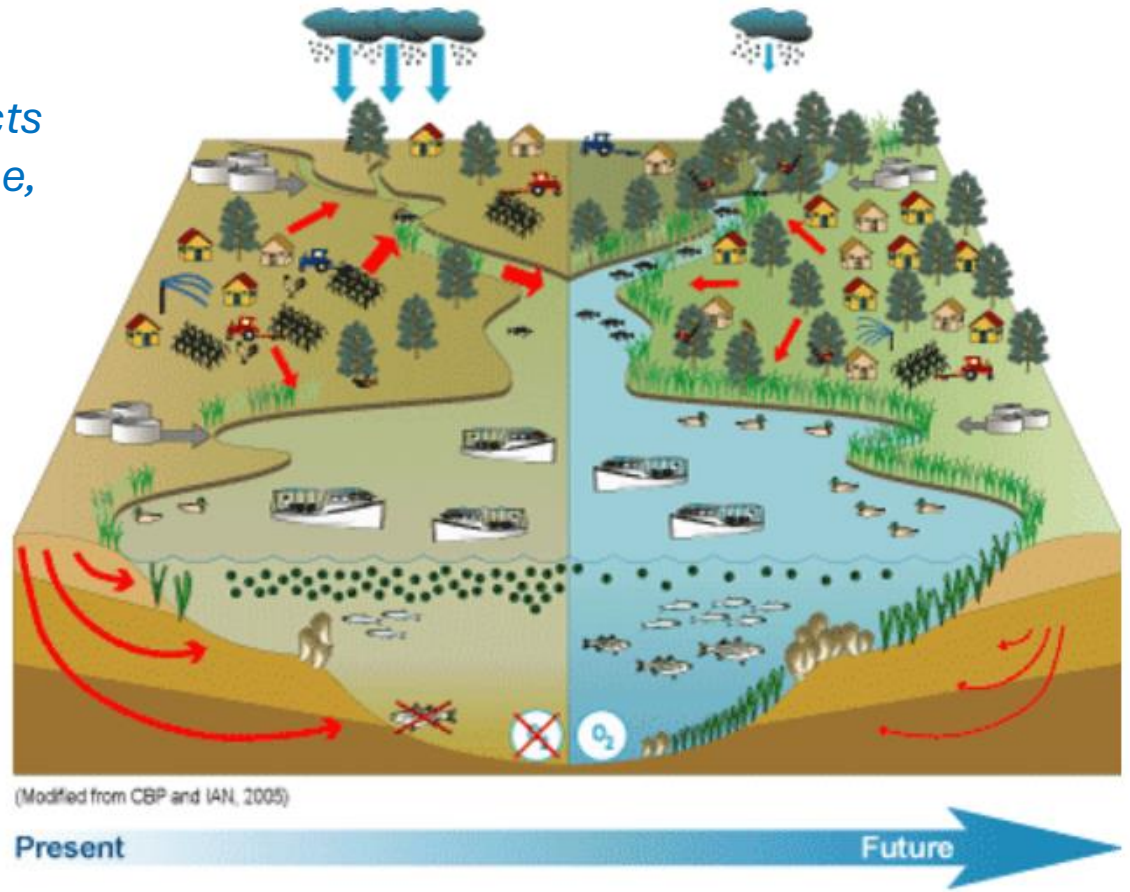
Species-independent condensed portfolio of issue-focused activities

Landscape
(Physical Environment)

- *Reduce artificial habitat impacts*
- *Improve connectivity, resilience, Reduce fragmentation*
- *Conserve/Protect lands*
- *Improve accessibility*

Living Resources
(Biological Environment)

- *Manage novel ecology*
- *Reduce the rate of invasives*
- *Maintain culturally, commercially important species (plants + animals)*
- *Raise ag efficiencies*



Water
(Chemical Environment)

- *Reduce pollutants (nutrients, sediments, toxics, AMD)*
- *Reverse degrading trends of critical habitat stressors (salt, plastics)*
- *Improve beach safety (Bacteria)*

Community
(Social Environment)

- *Elevate Stewardship (train leaders, e-Lit student, behavior change)*
- *Invest in Workforce Development*

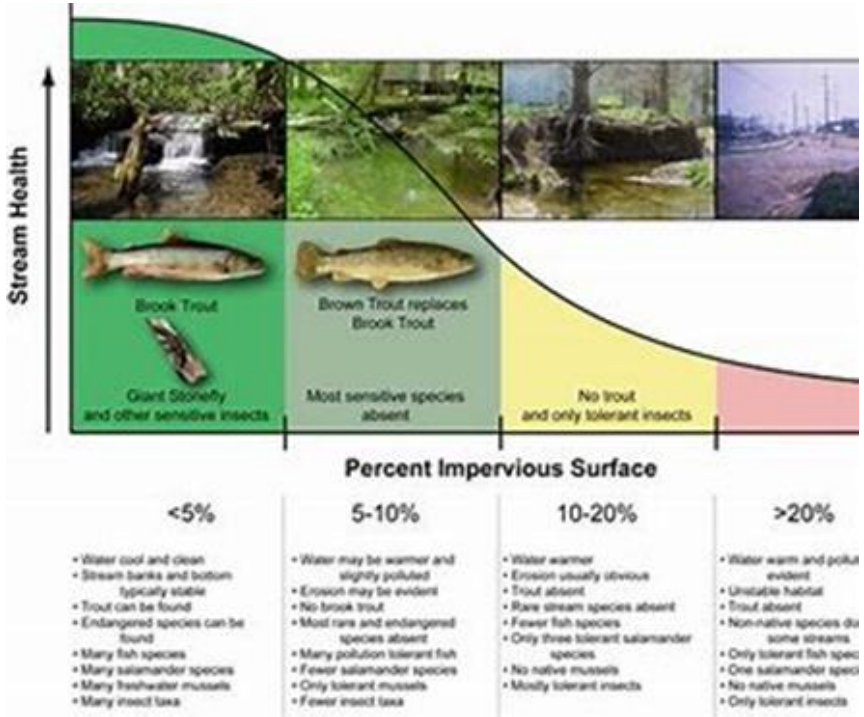
Context
(Rising temps, increased rains, sea level rise, novel ecology)

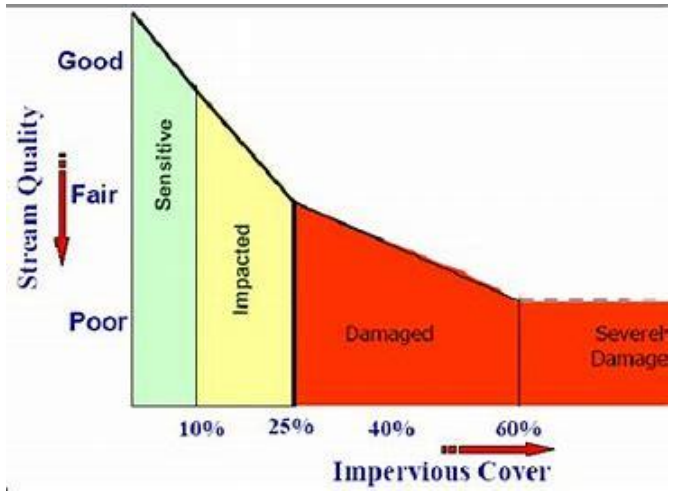
How and why 4 Goals?

Issue: Managing the Built Environment to generate
Cross taxa habitat improvement,
living resource management support

- **Example:**
- **Landscape infrastructure:** **Physical environment.** There is a mountain of literature on the effects of land development on physical, chemical and biological integrity.
- Indicators:
  - Gradient: Fractal fragmentation and dispersion index (FFDI) address shape, disorder, size of patches)
  - Longitudinal connectivity index

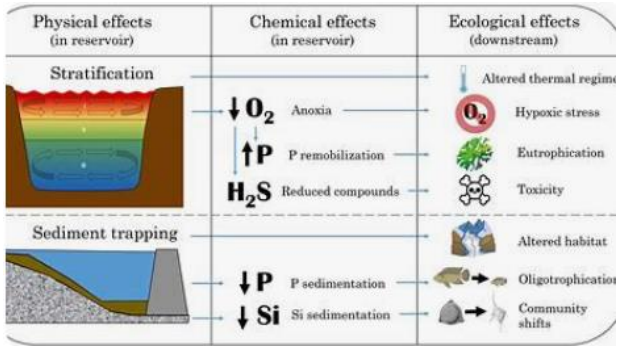
Imperviousness relation to Stream health, species distributions





Watershed hardscape tipping points

Dams/barriers and effects



"A rising tide lifts all ships"

Working together on cornerstones of habitat quality management: Artificial habitat - Shoreline integrity

A. Croaker, Bay Anchovy, Blue Crab, Spot: **10%**, impact thresholds. *Forage Action Team Report 2023, Seitz et al. 2019*.

B. Silverside: **20%** impact thresholds. *Forage Action Team Report 2023, Seitz et al. 2019*.

C. Anchovy , Hog Choker: **30%** threshold. *Forage Action Team Report 2023, Seitz et al. 2019*.

D. Ches Bay waterbirds: **3.4-3.7%,** threshold. Developed landcover primary stressor. *DeLuca et al. 2008*.

E. Benthic macros: **10%** threshold for developed shoreline, **12%** developed watershed. *Bilkovic et al. 2006*.

F. SAV recovery potential: **5.4%** tipping point with recovery capacity. *Patrick et al. 2014*.

G. General relationships – loss of beach habitat, wetland habitat with increasing hardened shorelines, (e.g., Gittman et al. 2025, Frontiers Ecol Env), loss of beach habitat decreases habitat for horseshoe crabs. Nesting beaches of turtles are lost. (unquantified)

"A rising tide lifts all ships"

Working together on cornerstones of habitat quality management: Artificial habitat - Shoreline integrity

Benefits and impacts cut across diverse taxa

Focused Community Work

Bring you're A-game! Stewardship, Fisheries, Habitats, SAV, WQ, Forestry Resilience

Issue: Shoreline Integrity Management

- Fish
- Crabs
- Macrobenthos
- Waterbirds
- SAV recovery potential
- Water Quality

E.g., Living Resources:

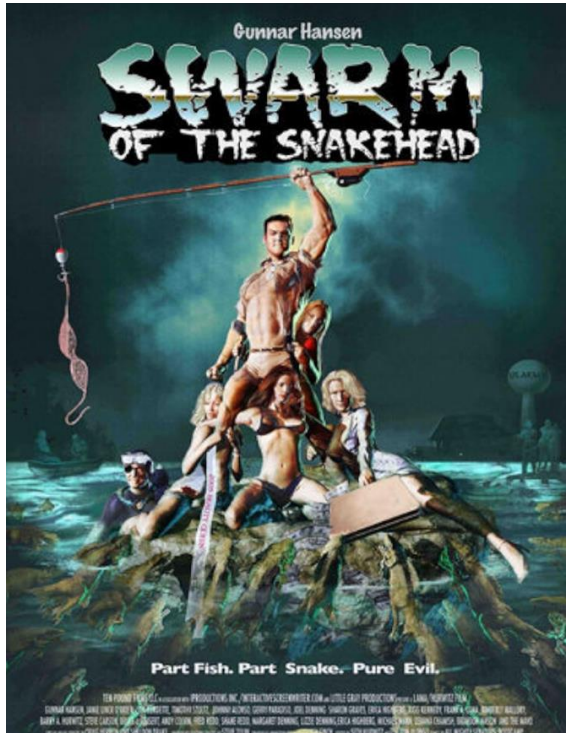
The Bay of the future will be different than the Bay of the Past

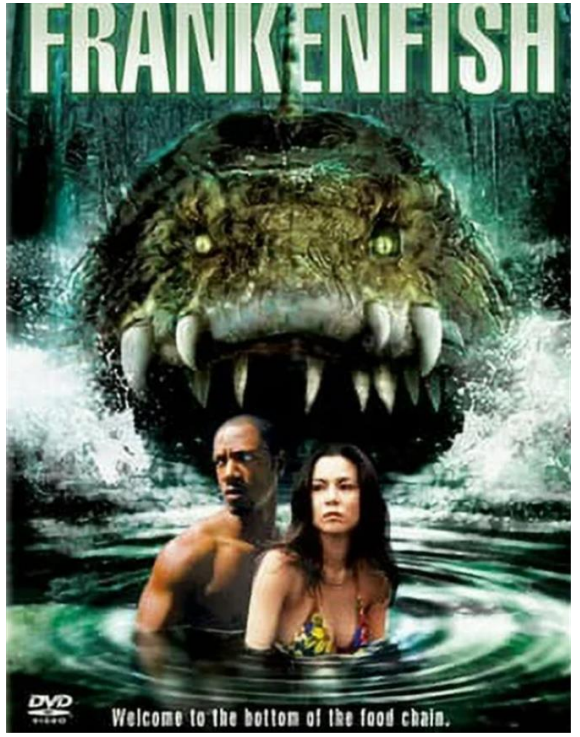
How and why 4 Goals?

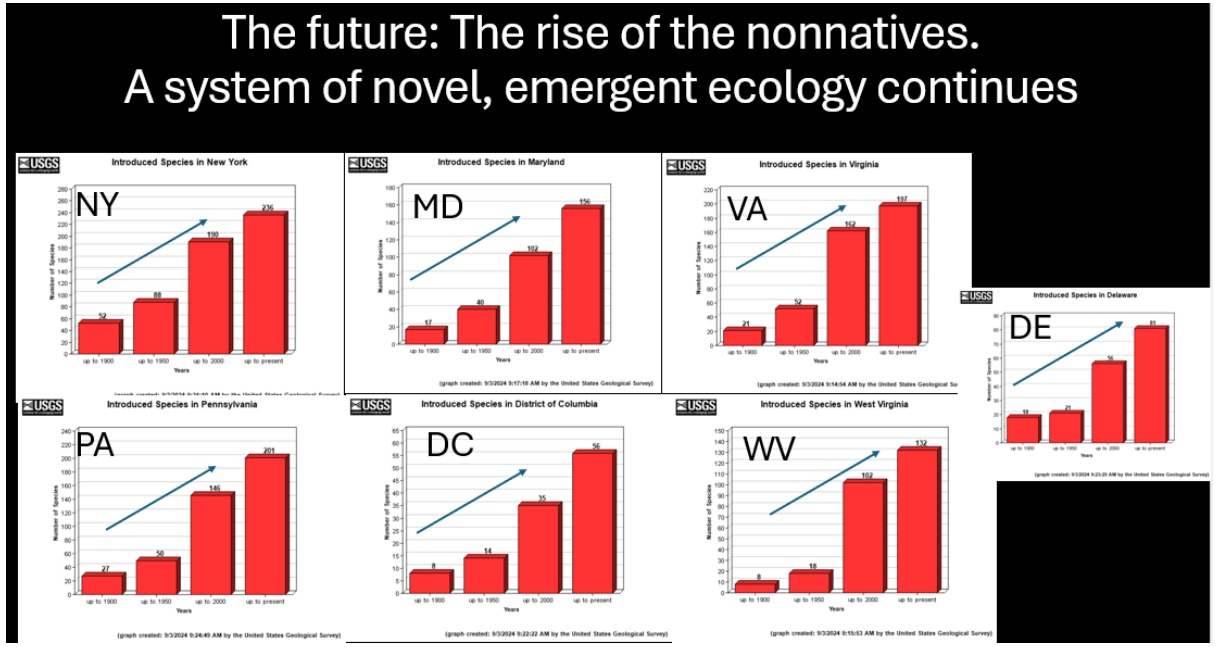
- **Living Resources**: People want tangible (edible even!) returns on their investments.

Outcomes: Reverse habitat stressor trends, support key species management.

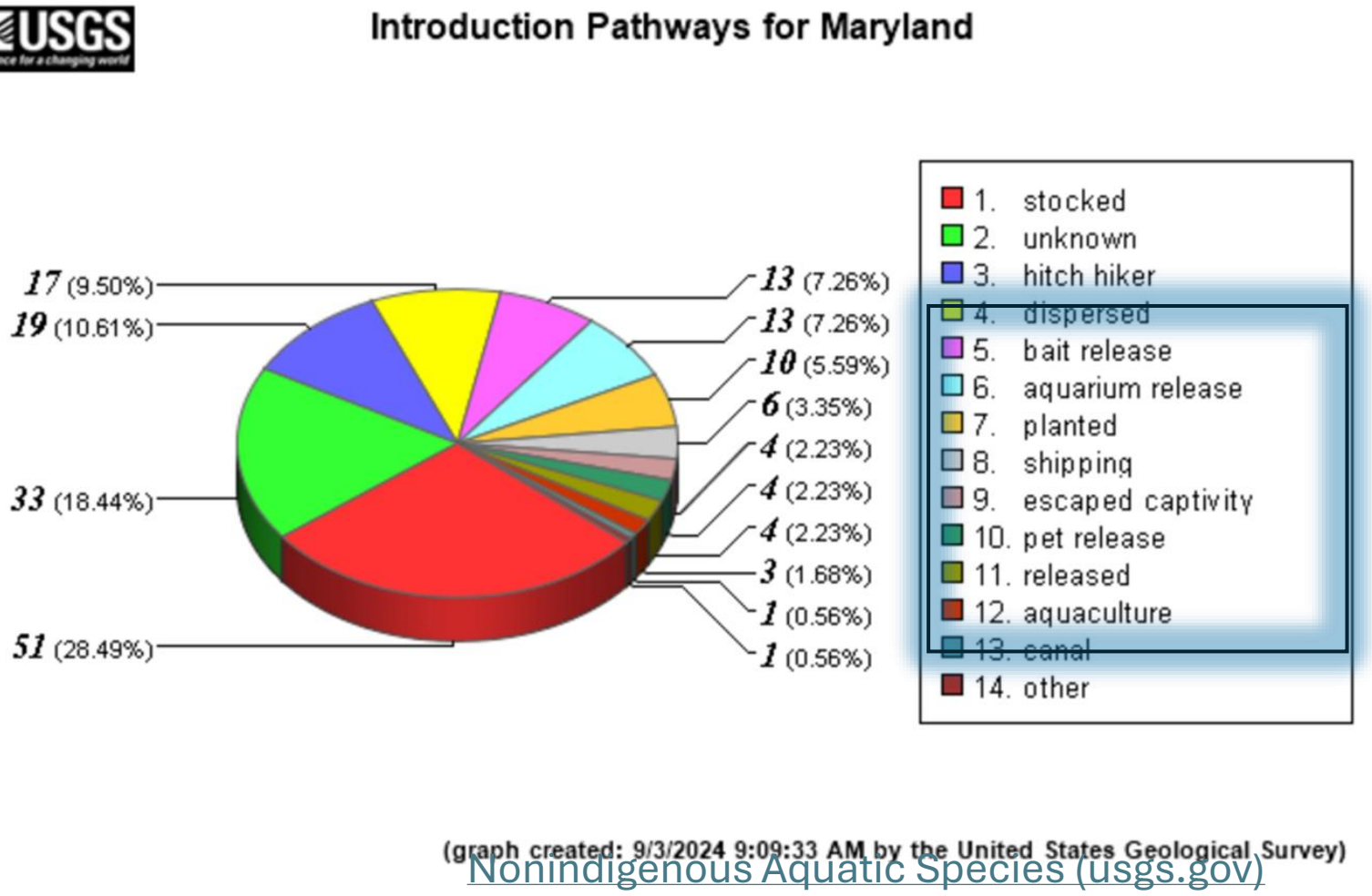
1. **Focus 1. Retain focus on commercially and culturally relevant communities of living resources and species.**
2. Manage for Novel Ecology! Invasive species task force = fish, bugs, plants, snakes, turtles and more.
    1. **Focus 2. Adapt our community** to established new species in our bay (redfish, shrimp, tarpon, etc. including use and control of nonnatives, e.g. blue catfish, snakeheads, etc.) Economic basis for harvest indicators.
    2. **Focus 3: Community Behavior Change.** Direct stewardship, end litlink to turn the tide on steady rising long-term trends in invasive species across our watershed. Ecosystem behavior – stabilize ecology invasion frequency.
3. Managing habitat resources…
4. Improve Ag Efficiencies



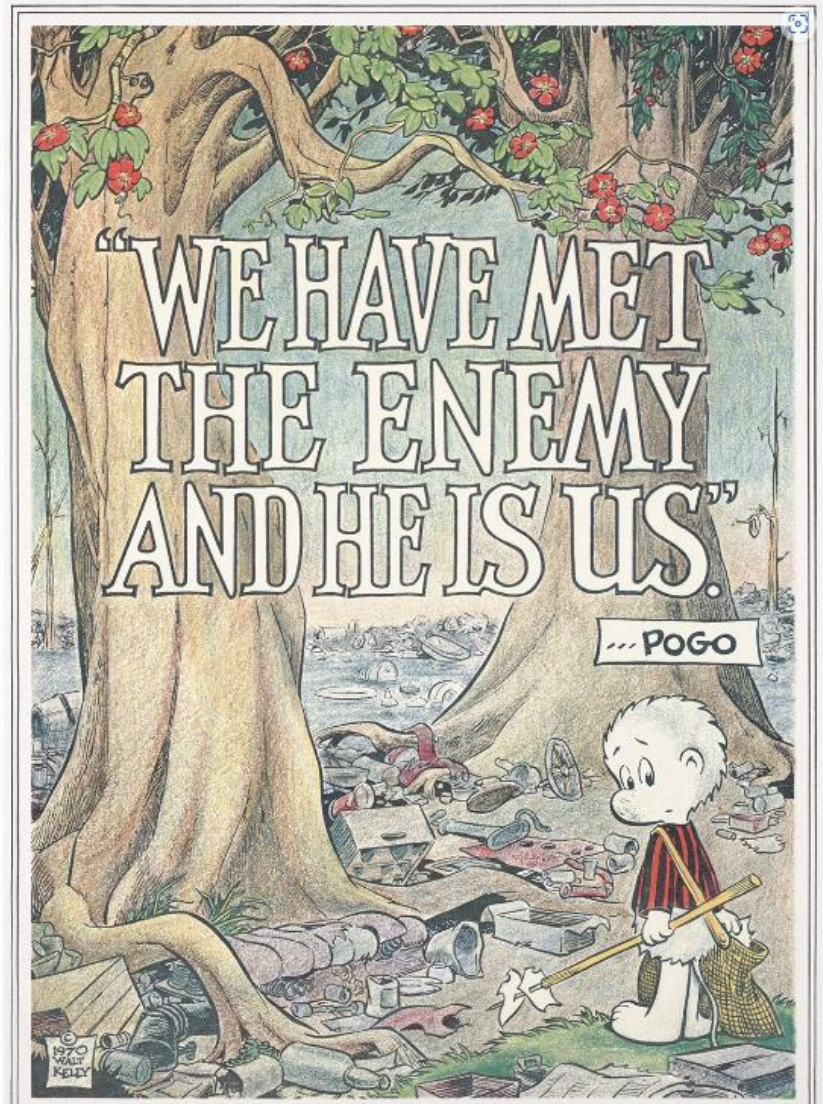




Each category represents a combination of a species introduced via a pathway. A single species can be introduced by more than one pathway and may therefore be counted more than once.



Nonindigenous Aquatic Species (usgs.gov)



Stewardship – we are our own worst enemies in the creation of novel ecology.

There is a clear role for literacy, leadership, and stewardship here.

What if we consider streamlining scenarios. Let's take 10 goals down to 4 for example

CBP Partnership: 10 Goals, 31 Outcomes

4 Goal
Conceptual Model for
Watershed/Bay restoration

Landscape
(Natural and Artificial infrastructure)

Community

Water Quality
(Tidal and nontidal aquatic habitat)

Living Resources
Terrestrial and Aquatic
Tidal and Nontidal

Context of Rising Temps
SLR, Precipitation

PT draft 3/2025